Assessing dietary changes of bats in the wake of White-nose Syndrome

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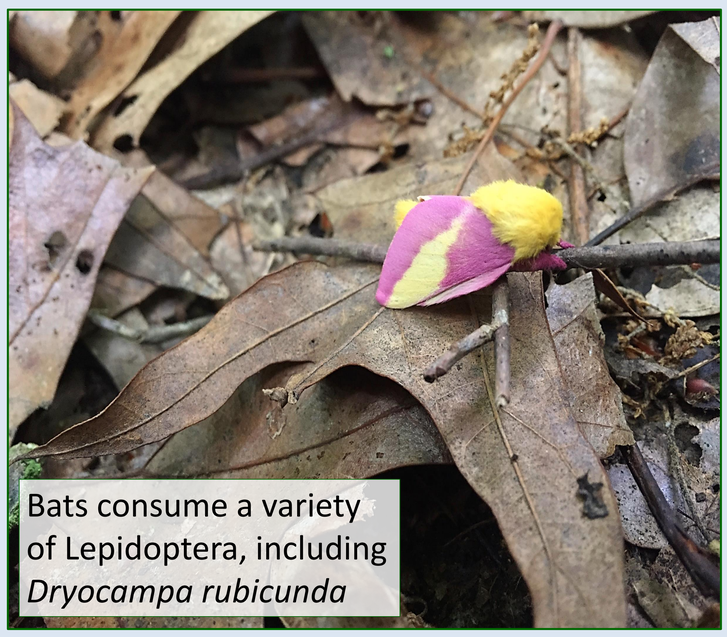
Introduction

- White-nose Syndrome has caused dramatic mortality in eastern North America's bats
- The resulting shifts in bat community structure may be accompanied by dietary shifts
- Lepidoptera are a core resource for most North American bats
- Energetic profitability may vary among Lepidopteran species
- Prey consumption likely relates to trends in prey nutritive quality

Myotis bats are highly affected by White-nose Syndrome

Objectives

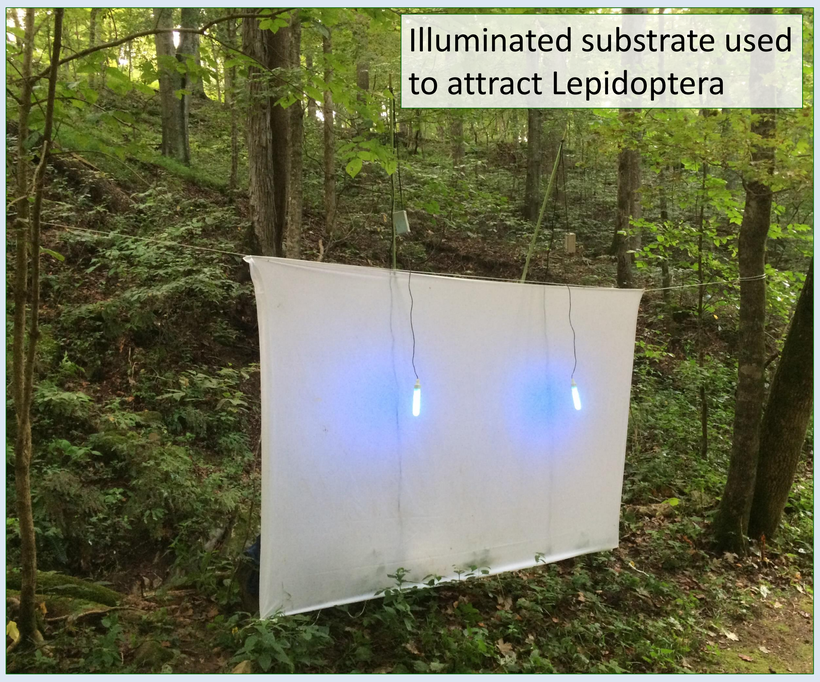
- Evaluate the nutritive quality of Lepidopteran prey at Mammoth Cave National Park
- Determine whether bat dietary composition has changed since the arrival of White-nose Syndrome



Bats consume a variety of Lepidoptera, including *Dryocampa rubicunda*

Calorimetry Methods

- *Malacosoma americanum* and *Trichoplusia ni* were reared in the laboratory
- *Halysidota tessellaris* and *Iridopsis* sp. were field-collected on an illuminated substrate
- Finely ground moth samples (ca. 250 mg) were combusted in a bomb calorimeter to determine the gross heat generated (calories / gram)



Illuminated substrate used to attract Lepidoptera

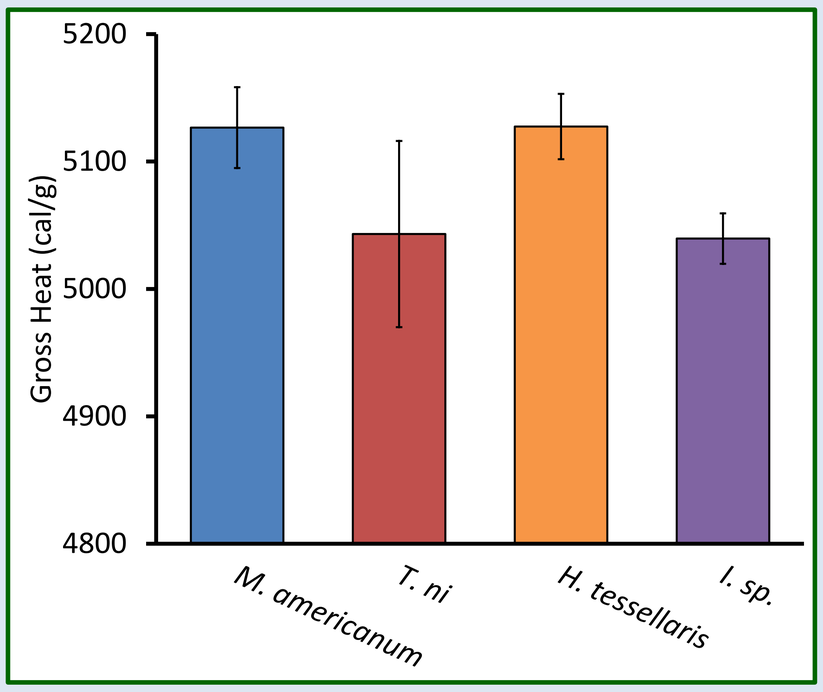
Molecular Analysis Methods

- Bats are captured at the entrance of Colossal Cave in the fall and spring
- Fecal material from captured bats is preserved in 95% ethanol
- Prey DNA will be extracted from fecal material, amplified, and sequenced
- Sequenced prey DNA will be identified to species using reference arthropod sequences

Processing a captured bat at Colossal Cave

Calorimetry Results

- Kruskal-Wallis tests were used to make pairwise comparisons
- Differences in caloric yield between *M. americanum* and *Iridopsis* sp. were significant (P = 0.03)
- No differences in caloric yields of
  - *T. ni* and *M. americanum*
  - *T. ni* and *H. tessellaris*
  - *M. americanum* and *H. tessellaris*
  - *H. tessellaris* and *Iridopsis* sp.



Discussion and Future Work

- Results indicate that a variety of Lepidoptera may be of similar prey quality; future research will include additional insect orders
- Molecular analyses of bat diets are ongoing; results will be compared to dietary data collected prior to the arrival of WNS

Acknowledgments

- Many thanks to Rick Toomey and Shannon Trimboli at NPS, Steve Thomas at CUPN, Rachael Griffitts at EKU, and Abe Nielsen at UK
- JFSP, USDA-FS, EKU BIOS, UK CAFE